

## Evaluation of IT Service Management Based on ITIL Framework in Banks of Industry and Mine (Service Operation Processes)

Mohammad Reza Taghva, Mohammad Taghi Taghavifard and Foad Fasihi  
Faculty of Management and Accounting, Allameh Tabataba'i University, Tehran, Iran

**Abstract:** The value and position of competition in banks is crucial and well-known. In past decades it did not matter much due to the governmental nature of banks but now the issue of competition in banks has become a top priority given that many private banks which have been established. Therefore, in recent years, banks pay special attention to the diversity of their products and services in particular electronic services and information technology. That's why we see topics such as IT Service Management (ITSM), Information Technology Infrastructure Library (ITIL), Control Objectives for Information and related Technology (COBIT) and Capability Maturity Model Integration (CMMI) developed in banks and financial institutions which increases the quality of their services. IT Service Management (ITSM) provides a structure through which IT processes, IT resources and information related to the strategy and goals of the organization will connect together. IT management integrates and institutionalizes the optimal ways of planning and organizing, preparation and implementation, delivery and support and monitoring and assessing the effectiveness of information technology. Based on previous findings, this study seeks to evaluate the status of IT service management at bank of industry and mining with standard review and expert opinion, the ITIL framework and CMMI Maturity Model were used to assess the situation. In this study, after an extensive study of the literature, a questionnaire which was available at the University of UCSIA (one of the Universities of Oxford in England) was used and according to experts, the questions prepared and divided into seven areas. Then, the questionnaires were given to all managers and experts of the Bank of Industry and Mine that were 45 people. After collecting information, current and desired levels and also the distance between these two levels were determined and shown for the areas of the Bank of Industry and Mine and then were analyzed. And finally, some suggestions were presented to improve the weaknesses of Bank of Industry and Mine. It should be noted that since this research is a case study, the analysis results of the Bank of Industry and Mine is unique for this organization and it isn't extensible to other organizations but the analysis method could be extended to other organizations.

**Key words:** IT service management, ITSM, ITIL, COBIT, CMMI

---

### INTRODUCTION

In many organizations, the role of information technology is no longer a usual service provider and supporter and it has become a strategic partner and businesses constantly restructure their operations to face with the increasing challenges of business environment. The biggest challenge for IT service provider is to reach lowest cost and best quality. This is manifested in different parts of the organization of which can be referred to increasing the productivity of human resources, provide more facilities and new capacities based on the real needs of the business. Today, the development and application of IT in all the fields and organizations has led to intense competition for better service and because of this organizations are heavily dependent on IT. In recent years, strategic importance

of information technology has increased drastically and information technology has become a business fundament of organization.

Today, IT service providers can no longer focus only on technology but should focus on quality of service and their relationship with customers and in recent years, IT functions found a service-oriented direction so as to be aligned with the business objectives (Mehravani, 2011). IT service management is a concept to support this strong and strategic change by which information systems can be provided as a contract to customers and performance can managed as a service (Pollard and Cater-Steel, 2009). Many organizations performed their IT operations through IT service management models that emphasize on the service life cycle. IT service management helps organizations by providing real benefits such as compliance and greater flexibility, cost effectiveness and

service-oriented direction (Mehravani, 2011). As a result, a growing number of organizations are implementing IT service management frameworks for improving IT services and processes. On the other hand, the implementation of multiple models of process improvement in terms of stress, morale and productivity can be challenging, so it will affect choosing the appropriate framework.

IT Infrastructure Library (ITIL) is one of the most widely accepted and most common IT service management frameworks in the world. ITIL offers best practices for planning and implementation of IT service management to improve quality, reduce cost and risk (Mehravani, 2011). Information Technology Infrastructure Library (ITIL) is a comprehensive set of guidelines to define the design and implementation of IT service management processes and currently it is the most widely accepted approach to IT service management in the context of global scale and Iran. With regard to the role of governance and its expansion in organization, ITIL can be introduced as a best practice to support the development of IT. IT assessment is very important to identify the weaknesses of IT governance (Adlassnig, 2009).

It can be concluded from this section that IT service management and adapting to modern standards play a vital role in the growth and survival of organizations. But few studies evaluated IT service management in Iran. Based on previous findings in this study we sought to evaluate the status of IT services with a review of standards and Iranian organizations and experts from the context of ITIL and service operations were used to assess. The aim of the service operation is to provide agreed levels of service to beneficiaries and customers. As well as managing the applications, technology and infrastructure that will help us.

**Research background**

**Theoretical background :** In an article titled “IT and Business Process Performance Management: Case Study of Itil Implementation in Finance Service Industry”, Spremic after explaining the key performance indicators, investigated the relationship between IT and core business processes, resulting in the collection of these KPI’s are measured and improved results. Results shows the quality improvement of IT services to better satisfy customers and staff and change the organizational culture.

In a study titled “ITIL Assessment in a Healthcare Environment: The Role of it Governance at Hospital Sao Sebastiao”, Velez LAPAO assessed the current state of

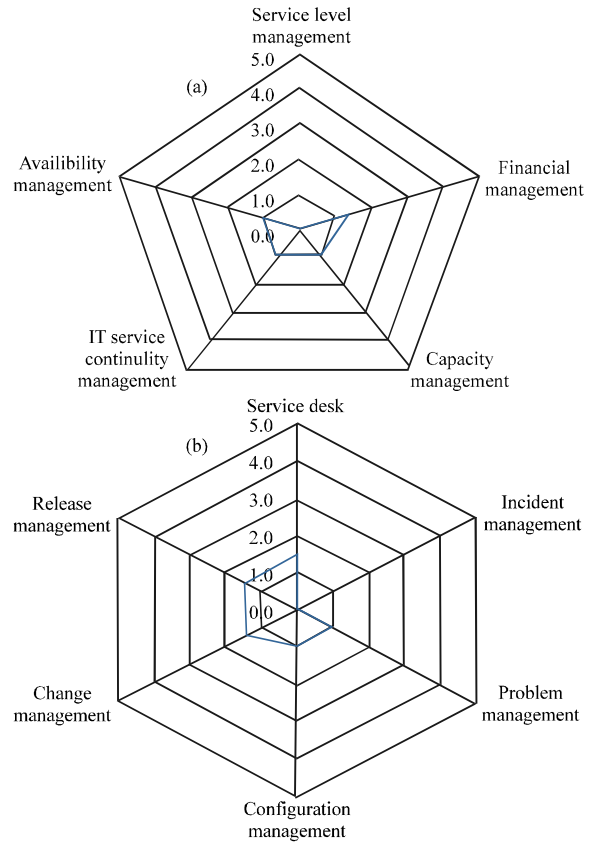


Fig. 1: The maturity of ITIL processes in Hospital Sao Sebastiao (using OGC questionnaires): a) Service delivery and b) Service support

ITIL in Hospital Sao Sebastiao (HSS) and the maturation process and analyze its impact on health services. Results are shown in Fig. 1 (Adlassnig, 2009).

In a study entitled “A Maturity Model for Implementation of ITIL V3”, Filipe has proposed a Maturity Model for ITIL implementation and a roadmap for improvement based on the priorities, dependencies and guidelines.

In a study entitled “Evaluate the Organizational Maturity of Pars Online to Implement ITIL to Improve the Quality of Services” in which data is collected using a questionnaire from experts within the organization and in the next stage, using outside organizational experts and statistical techniques such as AHP and Delphi Method, Paya achieved a measure of organizational readiness for implementing ITIL framework and finally by it is commented comparing the extracted criteria with the results of the organization’s readiness to implement this framework.

In a study titled “Using of ITIL and COBIT in the IT Service Management of Organizations”, Razzaghi tried to

provide a proper plan to manage IT services that include organizational Maturity Model (Razeqi *et al.*, 2010).

In a study entitled “Analysis and Enhance Maturity Level of Business Process in Electronic Banking: Case Study of Bank Refah”, Heidari review the current status of IT processes in terms of maturity of IT processes and the importance of this process and has identified the importance of using the techniques and has prioritized processes (Heydari, 2010).

In a study titled “Reference Model for the Adoption of IT Infrastructure in Iranian Representative Institutions”, Mehravani (2011) has identified six critical success factor and has classified them. He has proposed a research model based on information technology acceptance model to show the effect of these factors on the adoption of ITIL. Critical success factors used in this study: support of senior management, leadership and project management, communication and cooperation, training and competence of stakeholders involved in the project, change management and organizational culture, the implementation of ITIL processes and the technology used. The results show that leadership and project management, communication and collaboration, training and competence of stakeholders involved in the project are the most important factor in the adoption of ITIL (Mehravani, 2011).

In a study titled “Evaluating the Efficiency of ITIL Framework in Creating Alignment of Business and IT; Case Study: IT Organization of Tehran Municipality”, Zain al Abedin evaluated the effectiveness of ITIL framework for IT Organization of Tehran Municipality through investigate the effects on aspects of implementing ITIL alignment to Luftman Model (communication, values, governance, participation, territory and architecture and skills). The results of this study will help managers achieve maximum alignment in the field of information technology to promote and improve the level of IT service management.

In a study titled “Evaluation of the Degree of Readiness Iranian Grid Management Company in the Establishment of Framework for IT Infrastructure Library (ITIL)”, Haj Allahyar has identified five criteria for assessment of the degree of readiness in deploying ITIL and has classified them. These indices include: senior management support, IT infrastructure, organizational maturity, organizational culture, change management. Then structural equation modeling techniques were used. The results show that two categories are the most important indicators to measure the degree of readiness of Iran Grid Management Company in the deployment of ITIL: personal preparation which includes cultural readiness and strategic readiness organizational readiness which includes ready to lead, ready for maturation processes, structural preparedness and readiness for change.

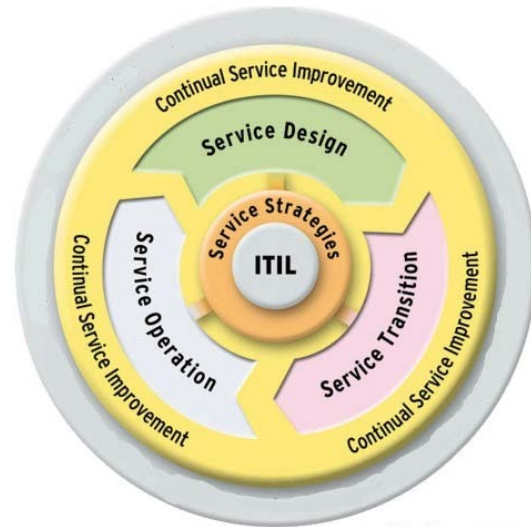


Fig. 2: Service life cycle of ITIL

**Experimental background:** Techniques and methods have been introduced to assess the status of IT service management, each of these methods have been focusing on a specific aspect which are described below.

Information Technology Infrastructure Library (ITIL) is a library consisting of best experiences and successful models in the IT management field that is now considered as a guideline framework for IT managers to manage the IT infrastructure in organizations and optimize their goals, requirements and business needs. In fact, ITIL enables administrators to support service level provided to the organization and to ensure the required infrastructure would provide according to a predetermined program. The third version of ITIL formed the basis of five main phases which are: service strategy, service design, service transition, service operation, continuous improvement of service (Fig. 2). In this version, themes and core of ITIL is expressed around the concept of service life cycle (Van Bon *et al.*, 2010).

Capability Maturity Model was developed using knowledge and experience in process management and relying on the principle that the quality system is strongly influenced by the process used in developing and maintaining it. This model has a comprehensive system approach to advance the organization to improve processes and achieve business objectives. CMMI guide to create and improve processes so as to create a complete process to achieve the objectives and priorities of the organization and to create a roadmap for continuous improvement processes in organizations. The maturity levels in CMMI Model is shown in Fig. 3.

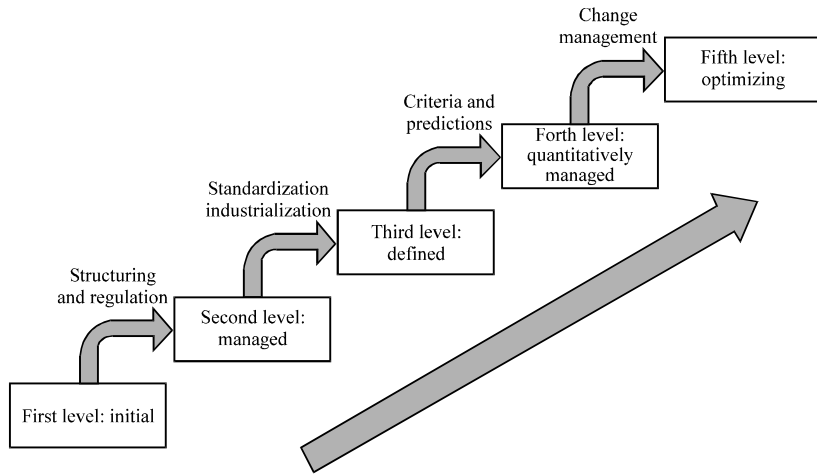


Fig. 3: Maturity level in CMMI

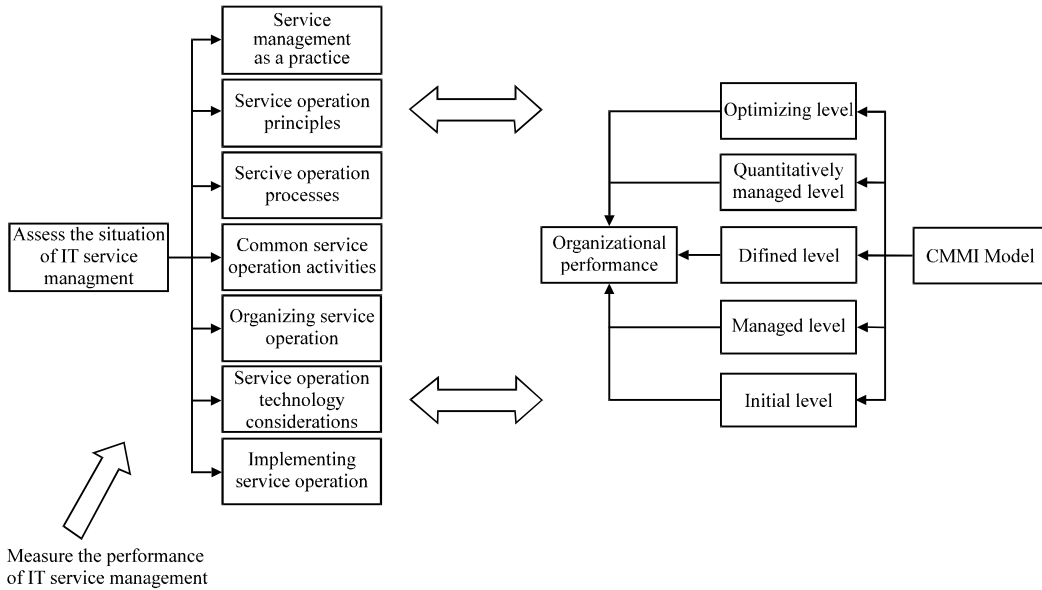


Fig. 4: The relationship between the measurements of IT service management with CMMI Model

COBIT Model manages the value belonging to the stakeholders and also the costs and risks belonging to the organization (such as a scale it creates a balance between value, risk and cost) and it achieves these goals through effective management. For the monitoring and management of IT activities, this framework provides a reference process model and a language comprehensible to all staff.

**Conceptual model:** According to models and concepts presented, basis would be presented based on a blending of CMMI Model and ITIL framework. The mentioned models cover most domains of IT services and

assessment approaches and can provide a solid base for information technology service management.

According to the aforementioned literature, assess models the status of IT services consists of 7 proposed dimensions. These dimensions are the factors that are associated with the operational areas of IT service management which include.

Service management as a practice, service operation principles, service operation processes, common service operation activities, organizing service operation, service operation technology considerations, implementing service operation and outline view of the model are shown in Fig. 4.

Table 1: Levels of assessment research

Scores	Levels	Qualitative description
1	Initial	Processes and activities are fragmented and unstable (or undefined)
2	Repeatable	There are being established processes and general activities and a level of discipline and commitment
3	Defined	All processes and activities are defined, documented, standardized and integrated together
4	Managed	The processes be measured by collecting detailed data, quality and suitable process
5	Optimized	Continuous process improvement is adopted. Processes and activities have reached full maturity

As mentioned above, CMMI has several levels that have been used in this research in the following (Table 1). As shown in Table 1 to better understand audiences, the second level titled “managed” has been renamed as “repeatable”. The following is an explanation of each of the aspects of assessment model.

**Service management as a practice:** In this study, the status of support of IT services will be checked.

**Service operation principles:** This study examines the necessary and general principles of IT service management which are essential for better performance of IT service management and plays a supporting role for it.

**Service operation processes:** This study examines the availability of processes required for managing IT services such as event management, incident management, access management, etc.

**Common service operation activities:** This part examines the IT service management common activities which are essential for better performance of IT service management and play a supporting role for it.

**Organizing service operation:** This part investigates the functions and activities of IT service management to organize activities and processes.

**Service operation technology considerations:** This part explores the most important requirements of IT service management and the most important requirements in the IT service management include: self-help, workflow, process management, remote control, diagnostics, reporting capabilities and dashboard.

**Implementing service operation:** To implement IT service management, organizations should plan to implement IT service management technologies before and during the launch of IT service management support tools; to have a successful implementation of IT service management as a result, this area is used to verify the status of implementation of IT service management.

## MATERIALS AND METHODS

In terms of purpose, the present study is an applied research. Applied research is a kind of research that used for executive agencies to solve the problem or special scientific or social issue. This study measures the current and desired situation of IT service management in banks industry and mine according to the ITIL framework. In terms of collecting data this study is descriptive-survey. And like many similar descriptive studies in which the questionnaires, interviews or observations are used to collect information, a questionnaire was used to collect. In this study, library methods (heuristic tools such as books, papers, theses, reports, digital texts, etc.) have been used for basic data collection and research background. Documents and information of IT professionals and ITIL framework documents was used for evaluation and selection of questions used to monitor and assess current and desired level of IT service management in the Bank of Industry and Mine. Finally, a questionnaire that included questions were approved by experts and was used to collect the required data.

**Research executive steps:** The project was carried out in seven steps whose executive steps are as follows: determine the purpose and expression and importance of the issue. Considering that Bank of Industry and Mine is currently running a core banking system, IT management provides a structure through which IT processes, IT resources and information related to the strategy and objectives of the organization are linked. In this regard, management’s assessment services will help Bank of Industry and Mine to identify the status of IT service management in the bank.

Studies related to understand the theoretical foundations of research include: research background and review conducted research about the IT management frameworks.

Select the service operation assessment model of ITIL lifecycle. The questionnaire is extracted by extensive studies and one of the databases of Oxford University and ITIL framework. The source of this questionnaire is UCISA University which one of the Universities of Oxford in England.

Table 2: The maturity of IT service management in the bank of industry and mine

Title	Current level point (of 5)	Desired level point (of 5)	The current state of IT service management maturity in Bank of Industry and Mine
Service management as a practice	2.04	4.19	The second level of maturity
Service operation principles	1.97	3.68	The second level of maturity
Service operation processes	1.57	4.16	The first level of maturity
Common service operation activities	2.00	3.59	The second level of maturity
Organizing service operation	1.66	4.25	The first level of maturity
Service operation technology considerations	1.31	3.81	The first level of maturity
Implementing service operation	1.25	3.51	The first level of maturity
Overall average	1.69	3.88	The first level of maturity

When it reaches the 0.8 points or more than that level has achieved a higher level of maturity

Design and distribute a questionnaire to experts for evaluation indices associated with IT service management maturity (evaluate the initial validity of the questionnaire).

The experts included all IT management professionals in Iran and in this regard, the university professors and all the people who were active at least 3 years in the areas of enterprise IT management have been used. Criteria for the selection of experts was based on level of expertise related to IT service management and the ITIL framework and these experts were searched via linked in social network.

Collect the initial questionnaires and studying validity and reliability of the questionnaire. By questionnaire, reliability and the ability to measure IT service management situation was examined by indices using the binomial test that 22 questions were omitted among the questions and other questions were transferred to the final questionnaire (state assessment of IT service management) to determine the level of maturity for each of the indices. Questionnaire reliability was assessed by Cronbach's alpha that was 0.877. At this stage, IT service management Maturity Model was finalized and the opportunity to assess the resulting model can be obtained.

Final design and distribute of questionnaires was to determine the maturity level of each of the indices in the Bank of Industry and Mine; the statistical population included all managers and IT professionals in Bank of Industry and Mine and we considered the central branch as the core of the research due to the presence of all managers and professionals IT at this branch. This community is comprised of people who were working in the center at the study period which was the first half of 2015. The number of people were 45 people. After the distribution of this questionnaire in Bank of Industry and Mine, maturity level of each of the factors can be studied.

Gathering the questionnaires and evaluation of IT service management maturity in Bank of Industry and Mine. At this stage, questionnaires collected and current and desired status of Bank of Industry and Mine was calculated for each of the factors.

## RESULTS AND DISCUSSION

Research hypothesis was about the existence of the gap between current and desired status in the Bank of Industry and Mine. In this study with the help of SPSS Software and using independent t-test, current and desired status in banks of industry and mining industry were compared with 0.05 error. Since, we had  $p < 0.05$ , so the null hypothesis was rejected and research hypothesis was accepted by 95% confidence.

In this study, a questionnaire was prepared in 7 areas using the ITIL framework and according to the expert opinion. And was placed in the hands of managers and experts in the fields of information technology, systems and methods in bank of industry and mining and given the structure of the questionnaire and the current and desirable level for questions, the areas were obtained. To get the points of the desirable level or the current level for each question, the averages on the basis of concessions made to the desired level or current level of the question were obtained. The simple average is taken to obtain the points of current and desired levels for each part (areas). These results were obtained after collecting the data of the selected organization (Bank of Industry and Mine):

As shown in Table 2, overall mean of all areas was obtained 1.69 which implies that Bank of Industry and Mine is in the first level of maturity (a situation between the initial level and repeatable level). The results show that the service operations processes, functions and activities of IT service management (organizing the service operation) have poor control and it is reactive and passive. Tasks performed somewhat regularly and in accordance with planning and a system has been created to establish general and repeatable processes throughout organizational units that need to be planned to improve the situation. Service management as a practice, service operations practice and common service operation activities are at the second level of maturity and had the most points in the areas of IT service management. The results obtained in these three areas indicated that the Bank of Industry and Mine has created support necessary for the performance management of IT services and do

not have any planning to manage it accurately and predictably. Requirements in IT service management IT (service operation technology considerations) and implementing IT service management IT (Implementing Service Operation) in total are at the first level of maturity (initial point) which indicates that banks of industry and mining has not yet fully implemented IT service management. Results obtained from Table 2 can be seen in Fig. 5.

In Fig. 5, the situation and the desired maturity level of IT service management in the Bank of Industry and Mine is shown which implies that the Bank of Industry and Mine is far from the desired situation.

**Analyze and evaluate the results:** The gap in IT service management is investigated in this study. The results of the previous section contains seven domains for IT service management maturity assessment which was divided into five main parts to be understandable for managers of bank of industry and mining and audiences. The role and priorities of each section are shown in Fig. 6.

As shown in Fig. 6, infrastructure necessary for the creation and management of IT operations management

can be seen in the supportive activities of service operation which is composed of three parts: principles of service operation, common service operation activities and implementing the service operations. As can be see, the results are shown in Table 3 and Fig. 7.

The results show that organizing service operation, service operation processes and service operation technological requirements had the most distance from the desirable situation.

As seen in Fig. 7 and Table 3, these score has been obtained. The desirable level of service operation as

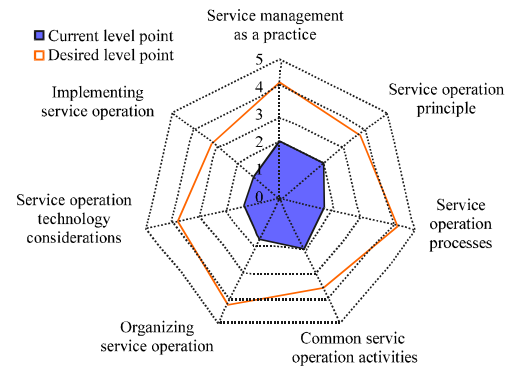


Fig. 5: The current and desired situation of IT service management in the Bank of Industry and Mine

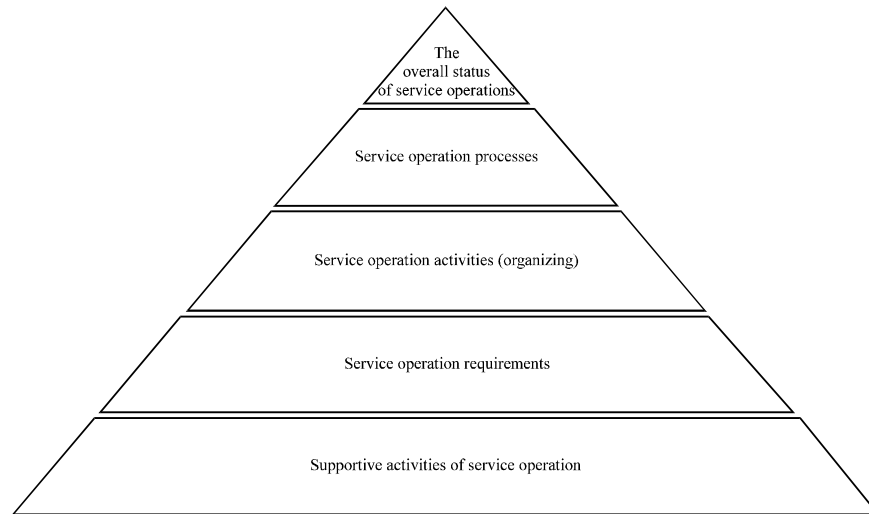


Fig. 6: Analysis of the results and their role in operations management

Table 3: Average distance to the desired level of IT service management

Titles	Current level point (of 5)	Desired level point (of 5)	Amount of distance to the desired level
The overall status of service operations	2.04	4.19	2.16
Service operation processes	1.58	4.16	2.58
Service operation activities	1.76	4.26	2.51
Service operation technological requirements	1.31	3.81	2.50
Supportive activities of service operations	1.74	3.59	1.85
Overall average	1.69	3.98	2.32

When it reaches the 0.8 points or more than that level has achieved a higher level of maturity

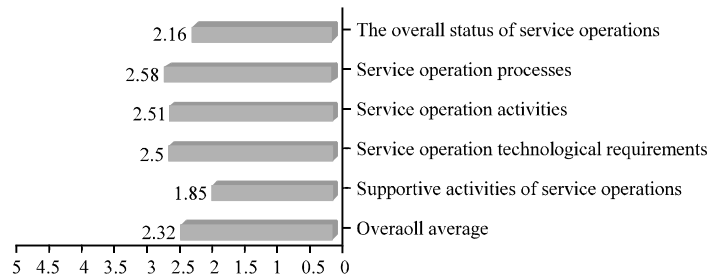


Fig. 7: Average distance to the desired level

practice is equal to 4.19 (fourth level of maturity) and the current level point is equal to 2.04 and it makes an interval that is equal to 2.16 which represents a relatively large distance to the desired level. Of the main reasons for this gap it can be pointed out to the lack of service desk and processes throughout the lifecycle, lack of service operation short-term goals and access management process in the Bank of Industry and Mine.

The desirable level of service operation processes is equal to 4.16 (fourth level of maturity) and the current level point is equal to 1.58 and it makes an interval that is equal to 2.58 which represents a relatively large distance to the desired level and low attention of bank to IT service management processes. Of the main reasons for this gap it can be pointed out to lack of long-term goals and short-term for event management, uncertainty of range and key performance indicators for event management, lack of long-term and short-term goals for incident management and access management, unclear boundaries and key performance indicators for event management and access management in bank of industry and mining.

The desirable level of service operation activities (organizing service operation) is equal to 4.26 (fourth level of maturity) and the current level point is equal to 1.76 and it makes an interval that is equal to 2.51 which represents a relatively large distance to the desired level. Of the main reasons for this gap it can be pointed out to lack of goals and technical management roles, lack of program management role and combined organizational structure.

The desirable level of service operation technological requirements is equal to 3.81 (third level of maturity) and the current level point is equal to 1.31 and it makes an interval that is equal to 2.50 which represents a relatively large distance to the desired level and low attention of bank to IT service management processes. Of the main reasons for this gap it can be pointed out to lack of integrated IT service management, weak self-help system, weak system configuration management, lack of diagnostic software, lack of IT service management dashboards and lack of database.

The desirable level of the supportive activities of service operation is equal to 3.59 (third level of maturity) and the current level point is equal to 1.74 and it makes an interval that is equal to 1.85 which represents a relatively large distance to the desired level and low attention of bank to supportive activities of service operation. Of the main reasons for this gap it can be pointed out to lack of service targets and performance criteria, lack of appropriate cost model for evaluating ROI and cost reduction strategies, weak information monitoring, lack of access to information needed for decision makers, lack of audit service operation, weak change management and lack of planning and capacity to develop in the coming years.

The distance to the desired level is very high and is estimated to be 2.32. In the current situation, there is little attention to the process and activities of ITIL. As a result, it is necessary to improve the conditions of planning.

## CONCLUSION

The results of the first phase of research led to present a model in which 177 questions in seven sections were confirmed. This is the result of the analysis binomial test according to the experts which could confirm these seven factors: the service management as a practice, principles of service operation, service operation processes, common service operation activities, organizing service operation, service operation technological considerations, implementing service operation. Cronbach's alpha was used to test reliability which was confirmed by the model. Then to assess the status of IT service management, the questionnaire was distributed among the population of the study included the managers and the staff of the Bank of Industry and Mine. The results of this research show that IT service management maturity in the Bank of Industry and Mine is in the initial level and planning is necessary to improve the strengths and eliminating the weaknesses in the area of IT service management.



## RECOMMENDATIONS

For future research can be in order to increase the generalizability of the model and lessons learned from implementation, the maturity of other organizations can be measured by this model and a model for the organizational IT service management strategies to align with the organization's overall strategy also can be developed. In addition, the role of IT service management in organizational performances and the relationship between ITIL and customer orientation in electronic banking can also be examined.

## REFERENCES

- Adlassnig, K.P., 2009. ITIL assessment in a healthcare environment: The role of IT governance at Hospital Sao Sebastiao. *Med. Inf. U. Healthy Eur.*, Vol. 150.
- Heydari, F., 2010. Analyzing and Improving Business Process Maturity Level in Electronic Banking: Case Study of Refah Bank, Master's Dissertation. Yazd University, Iran.
- Mehravani, S., 2011. A Reference Model for IT Infrastructure in Iranian Representative Institutions, Master's Dissertation. Al-Zahra University, Egypt.
- Pollard, C. and A. Cater-Steel, 2009. Justifications, strategies and critical success factors in successful ITIL implementations in US and Australian companies: An exploratory study. *Inf. Syst. Manage.*, 26: 164-175.
- Razeqi, M., H. Shirazi and M. Khoushnasib, 2010. Using ITIL and COBIT in the IT service management in organizations. *J. Military Manage.*, 11: 91-110.
- Van Bon, J., A. De Jong, A. Kalthof, M. Pieper and R. Tjassing *et al.*, 2010. Foundations of ITIL. 1st Edn., Van Haren Publishers, Netherland.